CHAPTER 8

PRESSURE SENSOR

SECTION I. DESCRIPTION AND LEADING PARTICULARS

8.1.1 INTRODUCTION

This chapter describes the operation and maintenance of the ASOS pressure sensor. The ASOS pressure sensor configuration consists of two or three model 470 digital pressure transducers, manufactured by Setra Corporation. Each pressure transducer is a highly accurate pressure measurement instrument that uses advanced microcomputer-based electronics and firmware, resulting in a 0.02% full scale accuracy.

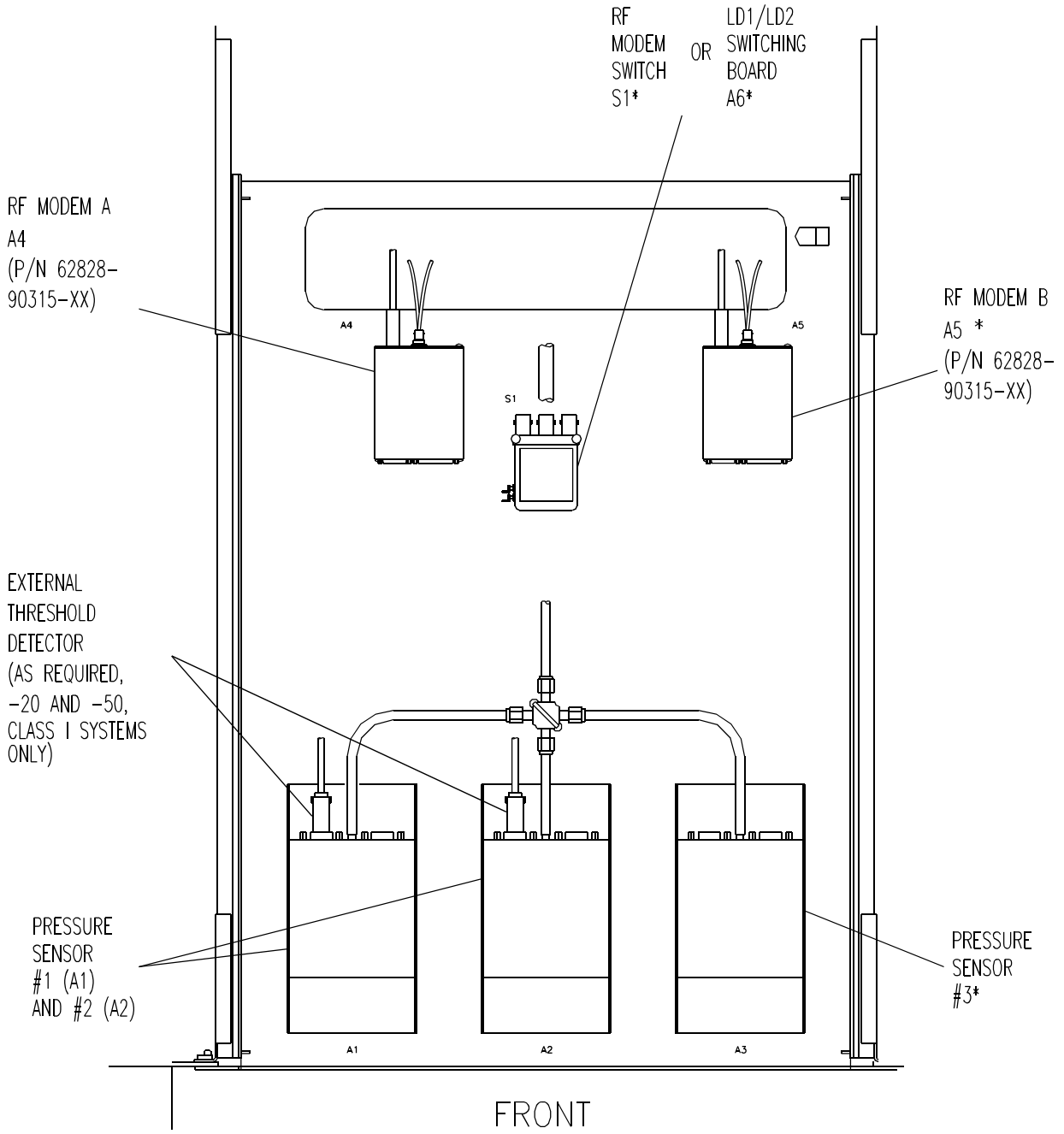
8.1.2 PHYSICAL DESCRIPTION

Two or three pressure sensors are mounted on the rf/pressure mounting shelf inside the acquisition control unit (ACU) or data collection package (DCP) as shown in figures 8.1.1 and 8.1.2. Refer to Chapter 14 for the position of pressure sensors in the Single Cabinet ASOS (SCA). The Class II ASOS system contains three pressure sensors. The Class I system typically contains two pressure sensors, but a third pressure sensor is available as an option. The pressure sensors share a common 3/8-inch tygon sensor tube for sensing barometric pressure. This configuration ensures reliable reporting of barometric pressure information. The tygon air tube is routed to the pressure drawer from a pressure port located on the connector panel. At some sites, the pressure port on the connector panel may be connected to an outside pressure vent via additional tubing. This outside vent eliminates the barometric pressure effects of inside environmental factors (such as heating and air-conditioning systems) on the pressure readings. During normal operation, the ASOS reads the pressure value from each of the sensors and compares the values to verify the accuracy of the measured data. $

Pressure sensors that are installed in Class I ACU cabinets must be equipped with threshold detectors, which may be either internal (built into the sensor) or external. A threshold detector ensures that the pressure sensor resets completely in the event of a dc undervoltage fluctuation (when its power drops below 4.55 vdc). Threshold detectors are not required on Class II systems because the ACU's uninterruptible power supply prevents such fluctuations. Internal threshold detectors were built into pressure sensors with serial numbers 358495, 358509, and 363914 and above. Internal detectors are added to all sensors when (and if) the internal circuit boards are replaced during depot repair. In these cases, a label is applied to the repaired sensor, indicating that an internal detector has been added. External threshold detectors are installed in Class I systems via FMK #027. The external detector is a small module that is mounted to the sensor's DB-9 power connector (J2). The external detector then becomes part of the pressure sensor and should not be removed (it is not an FRU). As part of the FMK, a label is placed on the pressure sensor stating: "EXTERNAL THRESHOLD DETECTOR REQUIRED".

8.1.3 PRESSURE SENSOR CONFIGURATIONS

There are two possible configurations of the pressure sensor: the model 470 (part number 90110-10), which has an operating temperature range of 55°F to 100°F and the model 470T (part number 90110-20) which has an extended operating temperature range of 35°F to 150°F. Each sensor configuration has three possible variations: the sensor with no threshold detector, the sensor with an internal threshold detector, and the sensor with an external threshold detector.



* INSTALLED ON CLASS II SYSTEMS.

NOTE

RF MODEMS AND RF SWITCH NOT INSTALLED ON SYSTEMS USING LINE DRIVERS 1A3A14 AND 1A3A15

LINE DRIVER RELAY NOT INSTALLED ON SYSTEMS USING RF MODEMS

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Figure 8.1.1. ASOS ACU RF/Pressure Sensor Mounting Shelf

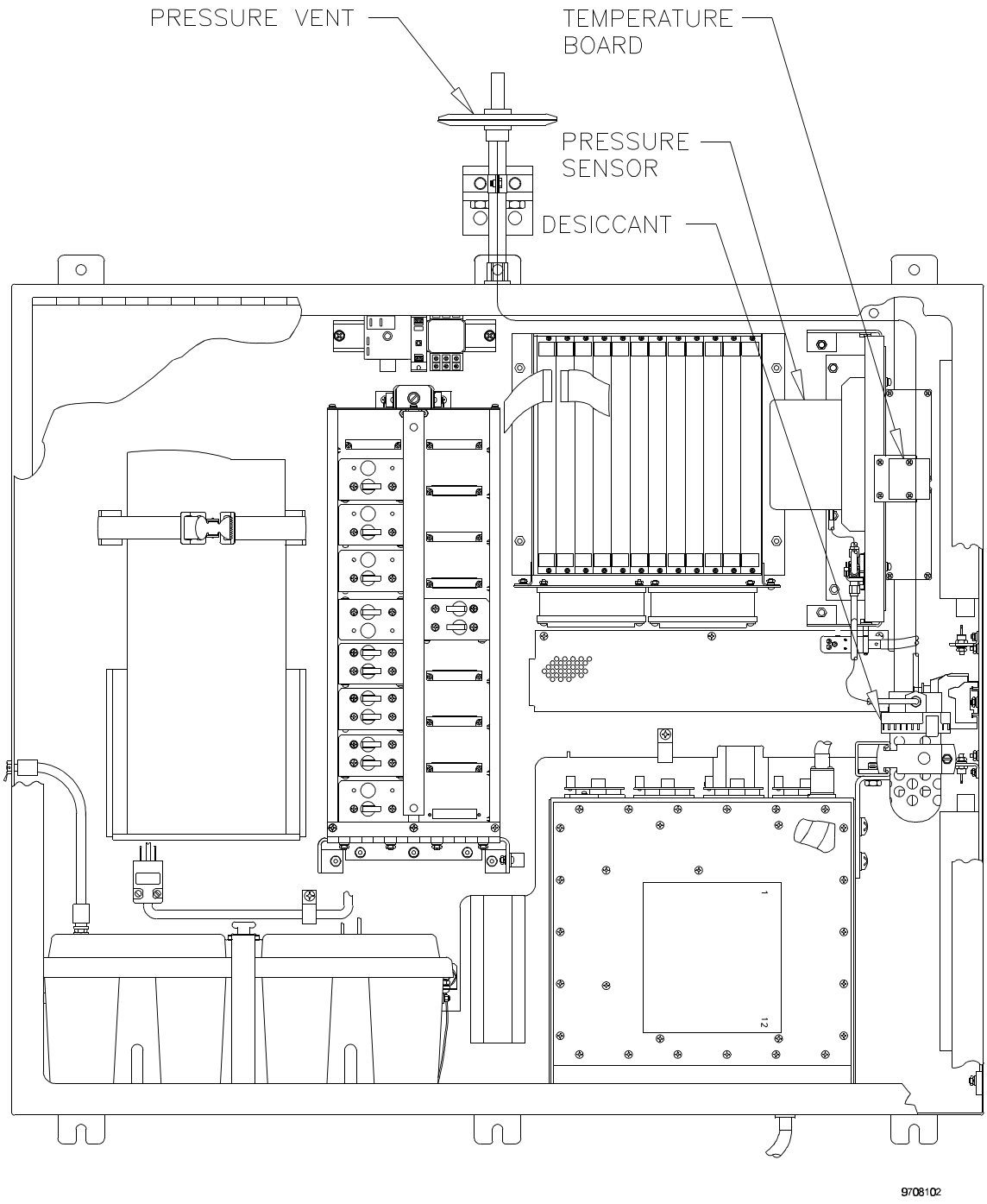

Figure 8.1.2. ASOS DCP RF/Pressure Sensor Mounting Shelf **$**

8.1.3.1 **Class I System Pressure Sensors**. Model 470 pressure sensors that are installed in Class I ACU cabinets must be equipped with threshold detectors, which may be either internal (built into the sensor) or external. A threshold detector ensures that the pressure sensor resets completely in the event of a dc power undervoltage condition. Internal threshold detectors were built into pressure sensors with serial numbers 358495, 358509, and 363914 and above. Internal threshold detectors are being added to sensors when they are returned to the depot for repair. External threshold detectors were installed on Class I systems via FMK #027. The external detector is a small module that is mounted to the sensor's DB-9 power connector (J2). The external threshold detector then becomes part of the pressure sensor and should not be removed (it is not an FRU). As part of the FMK, a label is placed on the pressure sensor stating "EXTERNAL THRESHOLD DETECTOR REQUIRED".

8.1.3.2 **Class II System Pressure Sensors**. Model 470 pressure sensors that are installed in Class II systems do not require threshold detectors because the uninterruptible power supply in the ACU prevents dc power undervoltage fluctuations. Model 470 pressure sensors with threshold detectors can be installed in Class II systems.

8.1.3.3 **Model 470T Extended Range Pressure Sensor**. The extended range of the model 470T allows it to be installed in the data collection package (DCP), SCA, or in other locations exposed to temperature extremes. The Model 470T has three possible variations as well (no threshold detector, internal threshold detector, and external threshold detector). If an external threshold detector is required in a particular application, the pressure sensor must be labeled "EXTERNAL THRESHOLD DETECTOR REQUIRED". Once an external threshold detector is installed, it becomes a permanent part of the 470T pressure sensor (it is not an FRU). The 470T can be installed in Class I and Class II systems. The 470T is the replacement unit of choice if a pressure sensor should fail. There are special applications that require the pressure sensors be installed in the DCP; the 470T pressure sensor must be used in these cases.

8.1.3.4 **Single Cabinet ASOS Pressure Sensor**. Refer to Chapter 14 for a description of pressure sensors installed in the SCA.

$ 8.1.3.5 **Data Collection Package Pressure Sensor**. Refer to Chapter 3 for a description of pressure
$ sensors installed at special application DCP sites.